

Claims

1. A linkage support system for a work vehicle, the work vehicle including a frame, a work tool, and a linkage for manipulating the work tool, the frame having a left mast portion and a right mast portion, the linkage support system comprising:
 - a load bearing support, the load bearing support being a portion of the frame located between the left mast portion and the right mast portion; and
 - a linkage pin support, the linkage pin support removably attached to the load bearing support, the linkage coupled to the linkage pin support.
2. The linkage support system of claim 1, further comprising a reinforced area of the frame wherein the load bearing support is the reinforced area.
3. The linkage support system of claim 1, wherein the load bearing support and the linkage pin support are removably attached by screws.
4. The linkage support system of claim 1, wherein the linkage pin support comprises an integrated linkage pin support.
5. The linkage support system of claim 4, wherein the integrated linkage pin support comprises at least two metal parts, the at least two metal parts being welded together.
6. The linkage support system of claim 4, wherein the integrated linkage pin support comprises a single metal casting.
7. The linkage support system of claim 1, further comprising a boom, the boom comprising:
 - a left boom portion having a first left boom end and a second left boom end;
 - a right boom portion having a first right boom end and a second right boom end; and
 - a cross tube, the first left boom end and the first right boom end respectively and pivotally connected to the left mast portion and the right mast portion, the second left boom end and the second right boom end pivotally connected to the work tool, the cross tube rigidly connecting the left boom portion and the right boom portion.
8. The linkage support system of claim 1, further comprising a linkage pin, wherein the linkage pin support has an access hole and an insertion hole, the

linkage pin being assembled to the linkage pin support by transporting the linkage pin through the access hole and inserting the linkage pin into the insertion hole.

9. A linkage support system for a work vehicle, the work vehicle including a frame, ground engaging means for supporting and propelling the frame over a surface, a mast, the mast forming a portion of the frame and extending upwardly from another portion of the frame, a boom having a first boom end and a second boom end, the first boom end being pivotally coupled to the mast, a work tool operatively coupled to the second boom end, and a linkage for manipulating the work tool, the linkage support system comprising:

- a load bearing support located on the mast; and

- a linkage pin support, the linkage pin support being removably attached to the load bearing support, the linkage being coupled to the linkage pin support.

10. The linkage support system of claim 9, wherein the linkage includes a first linkage end and a second linkage end, the first linkage end being coupled to the linkage pin support, the second linkage end being coupled to the work tool.

11. The linkage support system of claim 9, wherein the linkage includes a power tilt device, the power tilt device being coupled to the linkage pin support, the power tilt device powering the linkage.

12. The linkage support system of claim 11, wherein the power tilt device comprises a hydraulic tilt cylinder.

13. The linkage support system of claim 9, wherein the frame comprises the load bearing support.

14. The linkage support system of claim 9, further comprising a linkage pin, wherein the linkage pin support has an access hole and an insertion hole, the linkage pin being assembled to the linkage pin support by transporting the linkage pin through the access hole and inserting the linkage pin into the insertion hole.

15. The linkage support system of claim 12, wherein the linkage pin support includes a hydraulics access hole for supplying hydraulics to the hydraulic tilt cylinder.

16. A work vehicle for performing a work operation, the work vehicle comprising:
a frame;

ground engaging means for supporting and propelling the frame;
a mast extending upwardly from the frame;
a boom having a first boom end and a second boom end, the first boom end pivotally coupled to the mast;
a work tool operatively coupled to the second boom end;
a linkage for manipulating the work tool, the linkage having a first linkage end and a second linkage end;
a load bearing support located on the mast; and
a linkage pin support, the linkage pin support removably attached to the load bearing support, the first linkage end being coupled to the linkage pin support, the second linkage end being coupled to the work tool.

17. The work vehicle of claim 16, further comprising a linkage pin, wherein the linkage pin support has an access hole and an insertion hole, the linkage pin being assembled to the linkage pin support by transporting the linkage pin through the access hole and inserting the linkage pin into the insertion hole.

18. The work vehicle of claim 16, wherein the linkage pin support is an integrated linkage pin support.

19. The work vehicle of claim 16, wherein the linkage comprises:

a power tilt device; and
a bell crank, the power tilt device having a first tilt device end and a second tilt device end, the first tilt device end being pivotally coupled to the linkage pin support, the second tilt device end being operatively coupled to the bell crank.

20. The work vehicle of claim 19, wherein the power tilt device comprises a hydraulic tilt cylinder.

21. The work vehicle of claim 20, wherein the linkage pin support includes a hydraulics access hole for supplying hydraulics to the hydraulic tilt cylinder.

22. A method of manufacturing a linkage support system for a work vehicle, the work vehicle including a frame, ground engaging means for supporting and propelling the frame over a surface, a mast extending upwardly from the frame, a boom having a first boom end and a second boom end, the first boom end being pivotally coupled to the mast, a work tool operatively coupled to the second boom

end, and a linkage for manipulating the work tool, the linkage having a first linkage end and a second linkage end, the method comprising:

manufacturing a linkage pin support independently and separately from the frame;

using a portion of the mast as a load bearing support; and
removably attaching the linkage pin support to the load bearing support.

23. The method of claim 22, wherein the linkage pin support system includes a linkage pin and wherein the linkage pin support has an access hole and an insertion hole, the linkage pin being assembled to the linkage pin support by transporting the linkage pin through the access hole and inserting the linkage pin into the insertion hole.

24. The method of claim 22, wherein the first linkage end is coupled to the integrated linkage pin support and the second linkage end is coupled to the work tool.

25. The method of claim 24, wherein the linkage comprises a power tilt device and a bell crank, the power tilt device having a first tilt device end and a second tilt device end, the first tilt device end being coupled to the integrated linkage pin support, the second tilt device end being coupled to the bell crank.

26. The method of claim 25, wherein the power tilt device is a hydraulic tilt cylinder.

27. The method of claim 26, wherein the linkage pin support includes a hydraulics access hole for supplying hydraulics to the hydraulic tilt cylinder.

28. A method of manufacturing a work vehicle, the work vehicle including a frame, ground engaging means for supporting and propelling the frame over a surface, a mast extending upwardly from the frame, a boom having a first boom end and a second boom end, the first boom end being pivotally coupled to the mast, a work tool operatively coupled to the second boom end, and a linkage for manipulating the work tool, the linkage having a first linkage end and a second linkage end, the method comprising:

manufacturing a linkage pin support independently and separately from the frame;

using a portion of the mast as a load bearing support;
removably attaching the linkage pin support to the load bearing support;
coupling the first linkage end to the linkage pin support; and
coupling the work tool to the second linkage end.

29. The method of claim 28, wherein the work vehicle includes a linkage pin and the linkage pin support includes an access hole and an insertion hole, the linkage pin being assembled to the linkage pin support by transporting the linkage pin through the access hole and inserting the linkage pin into the insertion hole.

30. The method of claim 28, wherein the mast comprises:
a left mast portion; and
a right mast portion, the load bearing support being located between the left mast portion and the right mast portion.

31. The method of claim 28, wherein the linkage comprises:
a hydraulic tilt cylinder, the hydraulic tilt cylinder having a first tilt cylinder end and a second tilt cylinder end; and
a bell crank, the first tilt cylinder end being coupled to the linkage pin support, the second tilt cylinder end being coupled to the bell crank.

32. The method of claim 28, wherein the linkage pin support is an integrated linkage pin support.

33. The method of claim 31, wherein the linkage pin support includes a hydraulics access hole for supplying hydraulics to the hydraulic tilt cylinder.